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PERSPECTIVE

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Examining water and gender narratives and realities

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Abstract

There is a wealth of scholarly knowledge that aims to disentangle the complex relationship between gender and water. This scholarship coupled with practitioners' collective experiences and insights have resulted in the emergence of certain narratives that describe how unequal gender relationships to water are manifested and how they can be addressed. In this paper, we critically examine four of these water and gender narratives, myths, or realities: Are women solely responsible for water collection? Are women excluded from the global water workforce? Is technology is sufficient enough to solve water-related gender inequalities? Does participation in design and implementation of water services address gender inequalities? By reviewing existing evidence underlying these water and gender narratives that are prominent in much academic research and international programming, we show the nuances of water and gender relationships, and the discrepancies upon which these narratives are grounded. We draw on examples and research largely focusing on the Global South, but highlight a need for similar examination of these narratives in the Global North. Finally, we discuss remaining knowledge gaps and argue that these normative understandings overlook limited and potentially contradicting evidence on the intricacies of the relationship between gender and water.

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collection, gender, participation, technology, water jobs

1 | INTRODUCTION

A large body of knowledge has evolved over the last few decades describing the gender dimensions of water access and usage. The dichotomy underlying this knowledge system is the gendered division of productive and reproductive labor

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that sees men and women in charge of water management and provision respectively. In other words, women are charged with water collection and usage for reproductive tasks such as drinking, cooking, hygiene, and cleaning, while men manage water and use water when it is related to productive tasks such as agriculture and livestock.

The empirical evidence that constitutes this body of knowledge has often revolved around gender roles in water collection and water sector work, as well as solutions to address inequalities in the form of infrastructure and increased participation. Through scholarly research and practitioners' experience, these have emerged as common narratives of how gender and water intersect. These narratives, if accurate, are useful in supporting the design and implementation of interventions. These narratives, however, become problematic when they are not unpacked or challenged, and when emerging evidence does not support them, yet they continue to inform decision-making. In fact, continuing to assume that these narratives always apply can limit the ways in which policy-makers and practitioners work to shift harmful norms and practices. Left unquestioned, these heuristics risk leaving our collective understanding at a superficial level, relying on a rather static and binary comprehension of gender roles.

This binary narrative of water and gender has often been produced and reproduced in the water sector itself. For instance, the 1992 Dublin Principles asserted that "Women play a central part in the provision, management and safeguarding of water" (Gorre-Dale, 1992). A body of literature critiques the notion of women's "special relationship with nature" (Leach, 2007), a notion which also reinforces many water and gender relationships, without examining the critical underlying questions of power. These narratives have persisted in research, policy reports, practitioner materials and advocacy efforts, which can then affect policies in the water sector more broadly. For instance, the UN Water website states that "Addressing the needs of females in relation to water, sanitation and hygiene is a key driver in achieving gender equity and locking in the potential of half of global society" (UN-Water, n.d.). Resulting from this outlook, solutions have focused on addressing women's "practical" needs (Moser, 1989), such as infrastructure provision, rather than power relations between those advantaged and disadvantaged. This is often further supported by the notion that women are egalitarian and support approaches that promote equality and sustainable development (Joshi, 2014).

In this paper we critically examine four of these water-gender narratives: Are women solely responsible for water collection? Are women excluded from the global water workforce? Is technology enough to solve water-related gender inequalities? Does participation in design and implementation of water address gender inequalities? By reviewing existing evidence supporting these water and gender narratives that underlie much policy and practice in the water sector, we show the discrepancies upon which some of these narratives and stereotypes are grounded. We show that while gendered division of water labor is often shaped by patriarchal norms that are cross-cutting in society, these do not always operate in the same way, and are challenged at times. We argue that practitioners, policy-makers and scholars alike should avoid reinforcing harmful narratives as their use can lead to inappropriate solutions for complex challenges. Instead, we highlight the importance of collecting adequate evidence and being aware of context-specific power and gender relations. This enables us to be ready to challenge harmful norms and practices and address them through targeted approaches.

2 | ARE THE MAJORITY OF WATER COLLECTORS WOMEN?

The first and most commonly upheld narrative relating to water and gender is undoubtedly that women represent the majority of water collectors worldwide. First, it is worth pointing out that the focus of this narrative, although not always explicitly stated, is on unpaid water collection work for domestic uses, as there are men water vendors who collect water and men often collect water for livestock or other productive uses (e.g. Youngstedt et al., 2016). We examine where this narrative is accurate and where reality diverges from this assumption in several contexts.

Women and girls have invariably been found to be the main water collectors in several studies (Cassivi et al., 2018; Graham et al., 2016; Sorenson et al., 2011). A study of 24 countries in Sub-Saharan Africa estimated that 3.36 million children (62% female, 38% male) and 13.54 million women spent more than 30 min a day fetching water (Graham et al., 2016). Another study of 44 countries highlighted that women made up around 59% of water collectors compared to children (30%) and men (9%) (Sorenson et al., 2011). Finally, a survey of 73 countries showed that 53 of those were dependent on water collected by women (WHO, 2017). Ensuring household water security, particularly for the 26.3% of the world population without available tap water on premises(WHO/UNICEF JMP, 2017), who are mostly located in the Global South, is largely women's responsibility. This is a time and physically demanding task that has been historically assigned to women as part of the social norms that regulate the water gender division of labor, where women are

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responsible for the reproductive use of water—that is, cooking, cleaning, while men are in charge of the provision of productive water—that is, for agricultural production (Hawkins & Seager, 2010).

The task of water collection has numerous deleterious consequences for women and girls. First of all, the physical burden of carrying water—whether by hand or on top of the head—can lead to long-term injuries to the back, neck, or other joints (Geere et al., 2018; Sorenson et al., 2011). Second, this time-consuming task forces women and girls to give up or shorten other important activities, as in the case of education. In some cases, girls either miss or are late to school because of their work in ensuring household water security (Robson et al., 2013). Third, there is psychosocial stress involved in this fundamental reproductive task. Not being able to find water or long waits to fetch less than clean water can be a cause of anxiety and worry for women (Sultana, 2011). Finally, because of the emotional, physical, and time burden associated with water collection, women may limit their intake of water—whether through food or drink—and their usage of it for personal hygiene—to ensure water is available for their children and husband (Nounkeu & Dharod, 2021). Given the ramifications of water collection, women's bodies have been conceptualized as infrastructure in that they are the necessary material link to ensure that resources flow from inadequate infrastructure to the household. This unpaid work, which causes chronic and cumulative damage, makes it possible for water provision, particularly when shaped by informality, to function (Truelove, 2019; Truelove & Ruszczyk, 2022). Given the preponderance of women's water fetching role, when surveyed, men are often unaware of the gravity of household water insecurity and of the physical and emotional burden it causes for women (Nounkeu & Dharod, 2021). These arrangements can re-emerge, as seen in the Flint, Michigan, water crisis which resulted in a "new normal," where women hauled bottled water into their houses, and moved it around for everyday tasks from brushing teeth to cooking to protect their families from water contaminated with lead and pathogens (Radonic & Jacob, 2021). The persistence of these societal gender norms is due to a deeply rooted patriarchal system, also visible in men being mocked when collecting water in rural areas of Uganda (Asaba et al., 2013). As shown in the graphical abstract, this narrative often involves women being commended for carrying out these roles and water-related drudgery in challenging conditions, while the underlying gender norms supporting this practice are rarely challenged as harmful.

This gendered division of water collection labor appears to be prevalent in patriarchal, rural, and agricultural communities, which often tend to be the subject of these studies. Things however, differ in urban areas, where several studies have highlighted that men and boys are also responsible for water collection (Asaba et al., 2013; Geere & Cortobius, 2017; Hawkins & Seager, 2010; Robson et al., 2013). In a study of 23 countries or regions using UNICEF MIC surveys, nine surveys identified men as main water collectors both in rural and urban areas (Iraq, Jamaica, Kazakhstan, Mongolia Khuvsgul Aimag, Mongolia, Montenegro, Saint Lucia, Serbia, and Ukraine), while in four surveys (Pakistan Baluchistan, Pakistan Punjab, Indonesia West Papua, and Afghanistan) men were responsible for water collection in urban areas, but women were responsible in rural areas (Geere & Cortobius, 2017). Harris et al. (2017) noted that in urban areas in Ghana and South Africa, men who were asked about water fetching were more likely to emphasize their contribution than when women were asked. They concluded that water fetching is done by both men and women, and there is less strong distinction in gender roles in these urban areas compared to other findings from rural areas.

In some contexts, men or boys play an important role in water collection for household use. In Ulaanbaatar, Mongolia, Hawkins and Seager (2010) showed that 70% of surveyed households collect water via a vehicle and 15% with horses, and in both these instances men are in charge of that task. In rural Alaska, United States, Eichelberger (2010) describes how vehicles and male kin were viewed as critical for water security during disconnections or system failures as men could haul water or sewage. A survey of more than 1500 children between 9 and 18 in Malawi showed that 89% of girls and 66% of boys collected water, respectively, with 32% of boys carrying out this task daily with a median of 2 trips/day. While women and girls still had the biggest share of this burden, boys' role was not negligible (Robson et al., 2013). Gonda (2016) described the situation in rural Nicaragua where men are increasingly the main water collectors for household use due to the growing travel distance required linked to changing climate conditions, and their possibility to use animals. In this context, an assumption that women still held these roles led to an attempt to build water reservoirs as a gender-sensitive climate change adaptation technology that provided greater benefits to men. What these studies show is that it is not only women who undertake the reproductive task of water collection, men also participate and in some cases play a larger role. Nevertheless, under different conditions. Boys do carry water, but less often than girls, on average. Moreover, men often share the burden in urban areas, where they have access to either an animal or a vehicle to carry water. Shifting roles does not necessarily mean that women have been empowered in these contexts—limits to mobility and lack of control over freed-up time must be considered.

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The lack of a global gender-and-water database makes it impossible to comprehensively assess the contribution of men, women, boys, and girls, respectively in water collection. While the evidence characterizing women's burden is unequivocal, the literature on men's role in water collection is very limited. Studies need to go beyond a single case study approach in order to strengthen and refine an understanding of water collection as a manifestation of social patriarchal norms, as well as to develop appropriate interventions.

3 | ARE WOMEN UNDERREPRESENTED OR INVISIBLE IN WATER WORK?

When it comes to water work, a common narrative is that men conduct paid water work, while women are unpaid water collectors. A recent World Bank study reports that women play a crucial role in safeguarding water at home but are "significantly underrepresented in the water sector," holding only 20% of jobs (WBG and GWSP, 2019). This requires consideration of the term "water professional," and who actually comprises the "water workforce." In this particular World Bank study, the focus is on formal employment in water and sanitation utilities in a number of low- and middle-income countries, and this is contrasted with the role women play in household water collection and management. While attempting to highlight challenges faced by women, such messages can perpetuate and reproduce a strong bias toward technocratic work throughout the water sector. These biases can also be observed in other areas of the water sector such as irrigation (Zwarteveen et al., 2009) and transboundary water governance, where water control, status and expertise are linked to masculinity (Nguyen et al., 2019).

It is important to acknowledge a wide range of water work, going beyond technical positions to highlight the value of a range of roles, particularly as diversity is critical to the sustainability of services. Potter (2021) argues that a focus on water work that involves technocratic and finance positions overlooks jobs such as "health workers, human rights experts, community advisers, institutional and policy experts, social facilitators, planners, writers, communicators and so on" (Potter, 2021). Water sector work extends in many directions, and in many cases women's work is often invisible, not valued by society, and underpaid or entirely unpaid. Alda-Vidal et al. (2017) give an example of the myth of the male entrepreneur in the case of small-scale independent water providers in Malawi, which are viewed as individual businesses, where a man owns, manages and maintains the system. In reality, they observe that these providers are often run as family businesses, with women often taking key roles, such as entrepreneurial responsibilities in managing everyday negotiations with resellers, decision-making on financing, and dealing with customer billing and complaints. The result is a divergence between dominant ideas about who should conduct water work, and everyday practices, while also limiting women's recognition for tasks widely perceived as masculine.

Women are often involved in water work that is not only invisible but also informal, dangerous and stigmatized. In Accra, Ghana, Amankwaa (2017) found that 75% of informal street sachet water vendors were women, as this work could be obtained more easily than wage work and allowed schedule flexibility to combine street vendor work with domestic chores. However, this work is dangerous as it involves running between cars at traffic lights to serve customers, and is unpredictable and insecure. In the case of sanitation, in India, a large proportion of people engaged in manual scavenging are women, and face multiple forms of discrimination, including caste and stigmatization based on occupation (Shahid, 2015).

Across these different domains of water work, efforts are needed to better recognize invisible water work conducted by women, as well as to identify the bias and address barriers that limit women's participation in leadership and entrepreneurial roles in the water sector. Adams et al. (2018) describe the ways that women are offered low paid water kiosk attendant positions as part of Malawi's Urban Water User Associations, but are excluded from decision-making spaces, such as the WUA boards due to sociocultural norms and practices that assign community decision-making responsibility to men. This was further constrained by barriers such as women's perceptions of their limited education, management, and leadership experience, as well as lack of time, capital and social networks. There is hence a need to consider power relations across the different scales and range of contexts in which water work is done, and to investigate the pathways for greater representation of women in a wide range of leadership roles (Soeters et al., 2021). Drawing on interviews with women and people of color working in the water sector throughout the United States, Haeffner et al. (2021) argue that only a strong commitment to "representation justice" will ensure equitable access to water-related decision-making.

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4 | IS TECHNOLOGY AND INFRASTRUCTURE ACCESS THE SILVER BULLET?

One of the most prevalent narratives in the water sector is that better water and sanitation technology directly contributes to reducing gender inequalities. Unpacking this heuristic reveals a more nuanced, variable, and context-specific situation. In one example in Benin, increased access to water with construction of a borehole meant a decrease in water collection workload for women (Ivens, 2008). However, due to household bargaining around time use, women's overall workload did not decrease, and rather than empowering activities or leisure time, women used the extra time to work in their husbands' fields, which was their husbands' preference. When technology such as water pumps break-down, mechanics are often men, limiting women's control over both water and the technology itself (Ray, 2007). While some benefits of better access may have been achieved, these examples highlight how the often-promised empowerment and extra time arising from improved technology can depend on training to use and fix the technology, control over household resources, and decision-making power, issues that are often beyond the focus of those in the water sector. Climate change may further exacerbate these norms or provide an entry point to change unfair or harmful arrangements. In the development of a water supply network including pipelines, reservoirs, and treatment facilities in Rajasthan, India (Birkenholtz, 2013) showed how gender intersects with other social identities to determine benefits from technology. The result of the water supply network construction was that lower-caste groups lost their water rights, which particularly impacted low-caste women, while other groups of women with beneficial caste and class position enjoyed household water connections and their female children were able to go to school.

While achieving the SDG 6 targets requires access to water and sanitation on premises, in the meantime various technologies have been developed to assist women in carrying out their assigned roles as water collectors. The Hippo Roller, a rolling plastic barrel, to reduce the burden of water carrying in South Africa, and greater access to bicycles are examples that have been promoted (Kadota et al., 2020), but with limited potential to address underlying inequalities. Recent advances in the sanitation sector have developed "female friendly toilets." These toilets include features such as covered trash bins for menstrual waste that are routinely emptied, toilet stalls that are regularly cleaned, locks, doors, and lights. These toilets can meet many practical needs and meet the standards for the human right to sanitation, and in particular enable women users to feel safer in some contexts. Looking at this challenge from a broader perspective, Vijay Panchang (2021) describes women's everyday sanitation journeys to community toilet blocks in urban slums in Maharashtra, India. She describes male alcohol use as a cause of fighting and violent behavior, which "radiated to sanitation spaces, public spaces more generally," which may result in "untrustworthy men hanging around in public areas, including just outside CTBs." O'Reilly (2010) describes how household-level sanitation infrastructure is viewed positively as it contributes to reduced mobility and seclusion of women in rural, northern Rajasthan, India who no longer need to leave their compound to defecate. In this sense, it is viewed as a way of increasing the status of a family by increasing women's seclusion.

It is clear that access to safe and adequate water on premises will greatly improve the lives of women who spend time and energy collecting water for household use. It is also clear that viewing technology alone as a solution to gender inequality in the water sector is overly simplistic, and overlooks the important role of power relations. Gender roles are dynamic and may shift with drivers such as economic development or climate change. Instead, solutions must integrate the provision of better services, including technologies and policies, with consideration of power relations in households and communities that may enable or completely inhibit women benefiting from such advances.

5 | IS THE SOLUTION GREATER PARTICIPATION IN WATER GOVERNANCE?

Scholars and practitioners have asserted that inclusion of women in decision-making forums will lead to improved water governance. While this offers opportunities to address gender inequalities and human rights principles of participation, a growing interest is the belief that this will also lead to interventions or services that are more efficient, effective, and sustainable. In response, gender-responsive initiatives have been implemented to increase the quotas of women sitting in water management organizations, such as committees and associations. The assumption behind these initiatives is that merely sitting in the same room will ensure women's voices and priorities are heard (Caretta et al., 2015; Hannah et al., 2021).

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As the previous sections have shown, women's marginalization in the water sector is the result of unequal gender relations that are grounded in the subordination of women (Nelson et al., 2021; Zwarteveen et al., 2009). Typically, when water is used for productive tasks, particularly agriculture, women are consistently excluded from its management and governance (Coles, 2009; Imburgia et al., 2020; Zwarteveen et al., 2009). In some parts of the world, women are outright banned from participating in these forums (Caretta, 2015). This is compounded by related exclusions, such as women's limited ownership of land and other household properties, which may be needed for membership in water user groups (Adams et al., 2018; Bhattarai et al., 2021).

Gender-responsive participation initiatives, even when enforced through laws, have resulted in women's participation being mostly tokenistic or limited (Caretta et al., 2015; Hannah et al., 2021; Imburgia et al., 2020). In addition, this can also create a double burden of work if this is expected on top of other household work. All in all, it has been shown that these initiatives can shape or worsen existing inequalities (e.g., Masanyiwa et al., 2015). Women, low-caste groups, and other marginalized groups may choose to opt out of community participation schemes as they would join in disadvantaged positions, as shown in rural Rajasthan, India, where lower-caste women in village water committees members were seen as "tokens" with little power to fight illegal household connections (Cooke & Kothari, 2001; O'Reilly & Dhanju, 2014). Additionally, studies show that the participation of women in water users' associations or the use of irrigation technologies has not ensured the empowerment of women or the improvement of their living standards. In fact, their inclusion in meetings—even when mandated—can result in the reproduction of gender structures with women serving food to men and hence, adding to their already substantial share of care work (Caretta et al., 2015). Moreover, women might be afraid to speak up due to illiteracy or to cultural norms whereby speaking up is seen as a male characteristic and is perceived as negative in women (Zwarteveen et al., 2009).

Given the pessimistic state of women's participation in water management and its underlying structural drivers, scholars, and practitioners need to rethink gender responsive initiatives to identify solutions to truly increase women's participation through locally appropriate actions. For example, based on observations in Kenya, Hannah et al. (2021) propose that measuring success should focus on individual-level participation rather than gender ratios alone. In Nepal, Bhattarai et al. (2021) report that in some cases women leaders have been able to challenge the patriarchal systems that minimize their water problems, but call for open deliberation regarding the causes and consequences of the existing approaches and practices. Further, gender and social structures need to be questioned and changed, as masculinities are also changing, such as not always being the main breadwinner, taking on unpaid care work, or holding traditional masculine occupations (McLean, 2021; Rost, 2021). Accounting for this complexity may highlight ways to reduce the power imbalances in decision-making related to water resources and foster better enabling conditions for inclusive participation.

6 | CONCLUSION: ARE THESE MYTHS, NARRATIVES, OR REALITIES?

We examined four common water and gender narratives in the water sector. While researchers examining gendered power relations have often described the complexities and nuances of these narratives and how they vary among different groups of women and men (e.g. Fröhlich et al., 2018), more binary viewpoints toward gender relations, roles and norms are still prevalent in the water sector. Such approaches in policy and practice risk perpetuating harmful norms, particularly reinforcing unequal power relations between household members and within communities. We argue that reproducing these views as the normative and unchangeable situation can limit opportunities for challenging these ideas. Interventions should be based on context-specific understanding of water and gender relations across varying social, cultural, political, and economic settings, that extends beyond simplified division of gender roles for water-related work and infrastructure solutions. We have largely focused on research in the Global South, but a growing body of work on water insecurity in the Global North indicates a need for examination of these narratives in this context (Gerlak et al., 2022).

To move forward, we suggest attention is needed in two key areas: better collection of data to inform evidence-based decision-making, particularly measurement of gender norms and roles related to water, and engagement with transformative approaches to gender equality in the water sector.

Better data and measurement of gender and water outcomes is needed. Evaluations of WASH interventions, for instance, have rarely used indicators for gender outcomes, compared to well-established metrics for technical performance or public health outcomes (Kayser et al., 2019; Malolo et al., 2021). This knowledge gap results in a reliance on substantial anecdotal evidence or case studies when it comes to understanding gender and water narratives, as there is

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limited systematic collection of data related to gender outcomes. For instance, gender roles in relation to water have been shown to shift with changing climate conditions due to adaptation needs, such as seen in, for example, Nicaragua and India (Gonda, 2016; Singh & Singh, 2015), but little is known about these changes on a larger scale, and when they lead to shifts in power rather than reallocation of unpaid work. In other sectors such as global health there has been increasing attention to methods for measuring restrictive gender norms (Weber et al., 2019) and UNDP recently published a Gender Social Norms Index using data from the World Values Survey to highlight gender norms at a national level. Similar approaches could be applied to the water sector to understand when and how social norms change in response to different drivers. This could more effectively assess where water and gender narratives are myths and where they are realities, and allow more targeted interventions (Cislaghi & Heise, 2016). A growing awareness of these data gaps has led to proposals for a broad range of gender-responsive metrics for better data collection and monitoring in the water sector. The UNESCO World Water Assessment Programme Toolkit on sex-disaggregated water data provides indicators across a range of themes such as safe drinking water and sanitation, transboundary water governance, and water education and training, although few have been operationalized (Miletto et al., 2019). These include indicators such as (i) number of women or men employees in different water-related job positions, type of job or field, and respective salaries/wages, and (ii)traditional water-related roles, inside the household and in the community, for managing water resources; and associated perceptions of these roles and changes over time with reasons.

Secondly, the water sector would benefit from greater engagement with transformative approaches to development that have been increasingly promoted in other sectors (Hillenbrand et al., 2015). This is needed to expand a narrow focus on what has been described as practical gender needs for women, that is, a focus on ensuring women can fulfill their assigned reproductive roles by ensuring adequate nearby sources of water (Carrard et al., 2013). Moving forward, the water sector requires better attention to issues of power, including women's voice, agency and empowerment, going beyond traditional infrastructure provision projects (Dickin et al., 2021; Oxfam, 2020). This should involve understanding different groups of women's particular priorities and values when it comes to using and benefiting from water (Joshi, 2014). At the same time, attention to processes of resistance and backlash is needed, which can occur where prevailing power structures are challenged (Acosta et al., 2020). Practical lessons in implementation can be learned from other sectors, such as the Global Health 50/50 initiative and the Global Food 50/50 initiative, which were in response to stakeholder demands for accountability and action in progress toward gender equality at a global level, and focus on root causes rather than symptoms of gender inequalities. We recommend continued questioning of gender narratives in the water sector combined with targeted and evidence-based interventions that take power imbalances into account to address widespread inequalities.

AUTHOR CONTRIBUTIONS

Sarah Dickin: Writing – original draft (equal). **Martina Angela Caretta:** Writing – original draft (equal).

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CONFLICT OF INTEREST

The authors have declared no conflicts of interest for this article.

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Data sharing is not applicable to this article as no new data were created or analyzed in this study

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